



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 10
1200 Sixth Avenue
Seattle, WA 98101

February 16, 2006

Reply To
Attn Of: ECL-113

Gary Honeyman
Manager Environmental Site Remediation
Union Pacific Railroad Company
221 Hodgeman
Laramie, WY 82072

Bruce Sheppard
The Burlington Northern and
Santa Fe Railway Company
2454 Occidental Avenue South, Suite 1A
Seattle, WA 98134

Re: "Element of Work Engineering Evaluation/Cost Analysis Response Action Under the Comprehensive Environmental Response Compensation and Liability Act, Wallace Yard and Spur Lines" prepared by MFG Consulting Scientists and Engineers, dated August 2005

Dear Messrs. Honeyman and Sheppard:

Please find enclosed comments from the U.S. Environmental Protection Agency (EPA) on the above referenced document. These comments are both general and specific in nature and include those from the Idaho Department of Environmental Quality (IDEQ).

Should you have any questions regarding these comments or wish to arrange a conference call please contact me at (206) 553-2709.

Sincerely,

Tamara J. Langton
EPA Project Manager

Enclosure:
As Stated

cc:

Mike Cooper, MFG

Tom Mullen, MFG

Cliff Villa, EPA Office of Regional Counsel

Nick Zilka, IDEQ

Curt Fransen, Office of the Attorney General

Phil Cernera, Coeur d'Alene Tribe

Craig Trueblood, Preston, Gates & Ellis, LLP

Robert Lawrence, Davis, Graham & Stubbs, LLP

ENCLOSURE

EPA/IDEQ Comments on August 2005 Revised EE/CA

The U.S. Environmental Protection Agency (EPA) Region 10 and the State of Idaho Department of Environmental Quality (IDEQ) has reviewed the MFG, Inc. Consulting Scientists and Engineers (MFG) report titled *Engineering Evaluation/Cost Analysis Response Action Under the Comprehensive Environmental Response Compensation and Liability Act, Wallace Yard and Spur Lines* (August 2005). We have reviewed the Engineering Evaluation/Cost Analysis (EE/CA) relative to comments submitted in August 2004 by the EPA and the IDEQ.

In general, the EE/CA report has addressed many of the specific comments and concerns expressed by EPA and IDEQ (August 2004). However, not all of the questions and/or concerns that were identified by EPA and IDEQ have been adequately addressed. In addition, changes that have been made to the report have resulted in additional questions and concerns. Please note that, where possible, the numbering system established by EPA and IDEQ within the August 2004 letter has been maintained for easy reference.

GENERAL COMMENTS

EPA/IDEQ – General Comment 1: Although efforts have been made to identify and evaluate site-specific conditions and risks within the August 2005 EE/CA, no efforts have been made to establish the relationship between the Administrative Order on Consent (AOC) and the Interim Record of Decision (ROD). As with the May 2004 document, the August 2005 EE/CA briefly mentions the AOC and then proceeds to rely on findings of previous investigations and reports conducted within the Coeur d’Alene Basin (Basin) that may not be appropriate, or representative of site-specific conditions (e.g., selection of potential contaminants of concern, identification of potential remedies, etc.).

As noted within the revised EE/CA, primary human health and environmental concerns associated with the Wallace Yard (herein referred to as the Site) and Spur Lines, are related to mine waste materials (e.g., waste rock, tailings, and/or concentrates). The document identifies arsenic, cadmium, lead, and zinc as the Contaminants of Potential Concern (COPCs). As in the May 2004 EE/CA, with the exception of petroleum hydrocarbons and polychlorinated biphenyls (PCBs), the revised EE/CA has failed to consider additional site-specific COPCs within the evaluation of human health and ecological risks. As noted within the Wallace-Mullan Branch EE/CA (EPA 1999), additional metals potentially associated with mine waste or railroad properties may include mercury, antimony, and copper. Neither of the aforementioned heavy metals were mentioned or investigated within the revised EE/CA. As a result, the true nature and extent of COPCs and associated risks remains in question for the Site.

EPA/IDEQ – General Comment 2: The August 2005 EE/CA continues to heavily rely on Basin-wide findings and conclusions as outlined within the Interim ROD. As noted within Comment 1 (above), site-specific COPCs were assumed to be arsenic, cadmium, lead, and zinc. No attempts to identify, delineate, and/or quantify site-specific heavy metal/metalloid contaminant concentrations beyond those mentioned within the Interim ROD were made. In addition, although site-specific data has been collected to help establish surface water and groundwater interactions for the Site, the EE/CA fails to incorporate the data. For example, based on groundwater elevation data collected during the November 2003 and October 2004 sampling events, site-specific hydraulic gradients of 0.013 ft/ft and 0.009 ft/ft were respectively calculated, yet no estimates of groundwater flux (i.e., discharge) using simple relationships such as Darcy’s Law (see below) were provided. As with the May 2004 report, the EE/CA relies on a conceptual hydrologic model for the upper portion of the Basin, and aquifer properties estimated by others, to report a “Site” groundwater flow velocity ranging from 16 to 294 ft/day. With the exception of hydraulic

conductivity, it would be more appropriate to incorporate site-specific data into calculations of specific discharge and flow. It should also be noted that if grain-size analyses had been included in the Site investigation, a hydraulic conductivity could have been estimated using the Hazen Method.

Groundwater Flow (Q)

$$Q = -KA \frac{dh}{dl}$$

Where:

Q = Flow rate (ft³/day)
 K = Hydraulic conductivity (ft/day)
 A = Cross-sectional area (ft²)
 dh/dl = Hydraulic gradient (ft/ft)

Hydraulic Conductivity (Hazen Method)

$$K = C(d_{10})^2$$

Where:

K = Hydraulic conductivity (cm/sec)
 d₁₀ = Effective grain size (cm)
 C = Coefficient based on soil type

It should also be noted that the EE/CA employs infiltration calculations based on meteoric inputs (i.e., precipitation) to support site-specific surface water and groundwater interactions. These calculations would be appropriate when considering potential contaminant leaching characteristics and cover/cap design considerations. However, they are inappropriate for the intended use and provide no support to the conclusions. It is important to note that EPA does not disagree that groundwater elevations and flows underlying the Site are highly influenced by the South Fork Coeur d'Alene (CdA) River, but rather, questions some of the supporting evidence presented within the EE/CA to conclude that groundwater contributions are minimal.

EPA/IDEQ – General Comment 3: In the evaluation of site-specific risks (i.e., human health) and associated remedial actions, the August 2005 EE/CA has been appreciably improved. However, the EE/CA has not “rigorously” evaluated the appropriateness of Basin-wide conclusions as they relate to site-specific conditions, nor has it remained consistent with Basin-wide remedial actions and/or land-uses. For example, within the ROD, soil-remediation threshold levels and associated cleanup actions for “common use” areas have been identified to be similar to those proposed for residential yards. The August 2005 EE/CA identifies this categorical approach to be “excessively conservative,” citing that the Basin Human Health Risk Assessment (HHRA) identified no lead-based risks for adults performing typical recreational activities in common-use areas. As a result, the revised EE/CA proposes to evaluate lead-based risks on a case-specific basis using a range of lead action thresholds (i.e., 700–10,000 mg/kg). In principle, the evaluation of common-use areas and respective remedial actions on a case-specific basis may be appropriate; however, there is no evidence that this has been completed for this EE/CA. It should also be noted that due to maintenance concerns associated with high traffic use in recreational areas, vegetative barriers are not considered appropriate remedial actions. As a result, citing typical recreational activities performed by adults within the Basin could be considered as inappropriate in justifying the proposed increased lead remedial action threshold level for the Site. Rather, site-specific information should be evaluated to quantify an appropriate removal action lead threshold level(s). However, unless

site-specific information supports the higher threshold, the soil lead action threshold for common-use areas at this Site must be consistent with the Interim ROD which in turn will be consistent with the proposed Basin Institutional Control Program (ICP)

EPA/IDEQ – General Comment 4: As in the May 2004 EE/CA, a separate “industrial/manufacturing” land-use has been suggested for the Site that is inconsistent with the Interim ROD and the proposed Basin ICP. Based on an industrial/manufacturing worker having “incidental contact,” the August 2005 EE/CA has identified lead remedial-action threshold levels for industrial/manufacturing areas as being between 6,400 mg/kg and 10,300 mg/kg. As a result, interim measures proposed by the EE/CA are limited to the use of deed restrictions limiting area use to industrial/manufacturing applications, signage, and hydroseeding (e.g., Wallace Yards (WY)-2), with “soil removal or capping not required.” As indicated by the data collected to date, there are a number of sampling locations exceeding the proposed maximum remediation goal (i.e., 10,300 mg/kg), suggesting that capping or removal may be appropriate. It should be noted that the revised EE/CA has considered the elevated soil concentrations within the streamlined human health risk assessment; however, the elevated soil concentrations have been averaged with other sampling results and have not been evaluated individually. As a result, and as noted by EPA and IDEQ (August 2004), additional institutional controls may be required and should be further explored. As previously noted, the underlying assumption employed with the evaluation of risks at the Site is the presence of deed restrictions and/or caveats. However, the EE/CA does not identify how, when, or who will place such restrictions on the deeds. Similarly, it does not appear that future land zoning and planning considerations have been thoroughly reviewed as to how they may relate to site-specific environmental conditions. A question that should be asked is, based on current land-use definitions employed within the county and as listed within the Interim ROD, what are permitted usages in areas zoned as residential, recreational, or commercial? For example, even though lands may be zoned as commercial/industrial, a permitted use may include daycares and/or the presence of fruit-bearing trees. The EE/CA has not presented nor considered such possibilities and as a result, has not evaluated the risks accordingly. Based on current information, EPA and IDEQ will not consider a site-specific industrial/manufacturing land use and removal action threshold.

It is important to note that deed restrictions may serve to help identify property-specific limitations (e.g., areas of environmental contamination); they do not, however, guarantee current and/or future land-use or zoning issues. Typically, such decisions can only be considered by local or county land use planning and management divisions. It is recommended that a comprehensive review of State, County, and Local rules and regulations be reviewed to identify what limitations and options are available for the Site, and to ensure that the remedial options/alternatives are consistent with the Interim ROD.

It should also be noted that, regardless of designated land use, questions pertaining to future development/construction activities should also be addressed. For instance, what risk management tools and/or measures have been considered or will be required to facilitate area redevelopment? Regardless of land use designation, the installation of underground utilities and services may be required. As a result, during construction activities workers may be exposed to medium or high exposure levels inconsistent with risk calculations presented within the EE/CA. In addition, based on the nature and extent of contamination, will there be restrictions on suitable construction materials and what institutional controls have been developed should contaminated soils/groundwater be encountered during construction activities? Will contaminated soils be excavated and disposed of in an on-site containment facility, will they be disposed off site, or will they be used as backfill? If used as backfill, what will ensure that the contaminated soils are not left within the surficial soils (i.e., top 6 inches of the soil profile)? Please note that many of the above considerations may be beyond the scope of the current EE/CA but should be, at a minimum, acknowledged as limitations that will require consideration.

EPA/IDEQ – General Comment 5: The EE/CA has not evaluated “other ROW areas” based on exposure routes and contaminant concentrations as requested by EPA and IDEQ. It is acknowledged within the EE/CA that soil contaminant concentrations within Spur Lines exceed Basin-wide Preliminary Remediation Goals (PRGs) for terrestrial biota. However, it is also asserted that since the Spur Lines are “narrow strips of land” (MFG 2005), they do not provide consistent high-quality habitat worthy of protection. This is not an acceptable response, does not agree with Basin-wide remedial objectives, and in no way attempts to assess potential risks to terrestrial receptors. For example, Spur Lines typically make excellent access routes for terrestrial biota (e.g., ungulate species) within a given habitat range or between ranges. Therefore, at a minimum, risks associated with this and/or similar uses should be evaluated and presented within the EE/CA permitting for the assessment and development of appropriate remedial actions, if required.

It is disconcerting that as currently written it is implied that remedial actions will be completed by others (i.e., “Work to be performed as part of basin ROD...”), or that if remedial actions of adjacent residential areas do not overlap with the rail or railroad embankment, then no remediation will be required. The text should be revised so that it does not imply that all remedial actions associated with Spur Line rights-of-way (ROWs) will be completed by others regardless of present ownership. In addition, the selection of no action for common-use areas on Spur Lines needs to be further evaluated and explained.

EPA/IDEQ – General Comments 6 and 7: The EE/CA has expanded on the evaluation of human health risks at the Site but has not conducted a streamlined risk evaluation for ecological receptors. As presently written, the EE/CA states that because the Site “does not provide consistent and significant habitat to receptors of high ecological or societal value,” a streamlined ecological risk assessment was not completed. There is no doubt that historical activities conducted not only on the Site but within the Basin have adversely affected environmental conditions and reduced the quality of ecological habitats. However, one of the driving forces behind remedial actions within the Basin is to improve these conditions and facilitate an improvement in the ecological community. Based on groundwater and surface water data presented within the EE/CA, it is clear that water quality at the Site has been adversely affected. However, without additional water quality information (e.g., hardness), it is unknown how these elevated concentrations relate to aquatic toxicity and as such, what site-specific remedial options may be the most appropriate. This requires further explanation and revision.

The EE/CA cites the mass of tailings historically discharged into the South Fork CdA River and by upstream sources but does not consider potential releases and/or receptors during flooding events from the Site. Based on the information presented to date, it would appear that a site-specific streamlined environmental risk assessment is required.

As noted within General Comment 5, additional work is also required to assess ecological receptors and risks for the Spur Lines. Presently, the assessment of ecological receptors for Spur Lines is limited to estimated annual sediment loads from embankments. Based on the calculated annual loading rates, it was concluded that the impacts to both Ninemile and Canyon Creeks would be negligible. Unfortunately, the EE/CA does not provide any supporting information, assumptions, or sample calculations for the predicted sediment loads and, as such, remains questionable.

Based on the information presented within the EE/CA, it would be premature to conclude that “the Site is not contributing any adverse impact to ecological receptors in any material way and therefore, remedial objectives for this EE/CA are not necessary to protect ecological resources at this Site.” Knowing what benchmarks have been established for the South Fork Coeur d’Alene River, additional work to fully explore existing and future ecological receptors is required.

EPA/IDeq – General Comment 8: The August 2005 EE/CA continues to rely on the arithmetic mean of all samples within a depth interval as a comparison to the remediation goal and has not attempted to evaluate the spatial distribution of concentrations and/or apply a more rigorous statistical approach in the interpretation of results. Statistics presented within the EE/CA are limited to number of samples; frequency; and mean, minimum, and maximum concentrations. As per EPA's and IDEQ's August 2004 recommendations, evaluating the spatial distribution of contaminants would be much more pertinent and may serve to identify more appropriate and effective remedial actions. Currently, soil contaminant concentrations illustrated on Figures 2-5 through 2-17 are difficult to read, grossly grouping varying degrees of soil contamination without delineation.

EPA/IDeq – General Comment 9: With the exception of hydraulic gradients calculated for the November 2003 and October 2004 sampling events, and the development of a groundwater potentiometric map, site-specific hydrogeology has not been adequately explained within the EE/CA. As with the May 2004 EE/CA, a conceptual hydrogeologic model developed for the upper portion of the CdA Basin is used to establish Site conditions. No information regarding depth to groundwater and aquifer thickness is provided. In addition, boring logs of groundwater monitoring wells have not been included, and no discussions regarding the location of groundwater monitoring wells relative to flow direction and contaminant concentrations have been completed. As noted within General Comment 2, no estimates of groundwater flux and associated metals loadings to the South Fork CdA River have been made, and no explanation as to why metals concentrations (e.g., cadmium and zinc—dissolved and total fractions) increase from surface water monitoring stations SW-3 to SW-4. It should also be noted that, as drawn, the potentiometric surface map does not consistently correspond with the anticipated losing and gaining sections of the South Fork CdA River. Typically, in gaining sections of a stream/river, groundwater contours "V" upstream, while in losing sections, they "V" downstream. This is not consistently illustrated within Figure 2-18. As with soil contamination, a figure identifying the spatial distribution of groundwater contaminants would be extremely useful.

The EE/CA has presented meteoric infiltration calculations to support observations of net gaining and losing sections of the South Fork CdA River. These calculations are not believed to lend any support to explaining surface and groundwater interactions as presented within the EE/CA. Such information must be evaluated on a watershed basis and would be appropriate in helping to design remedial covers/caps for the Site. To evaluate Site water interactions and surface-water loading rates, estimates of groundwater flux (i.e., Q) through the Site are more appropriate and should be completed.

EPA/IDeq – General Comment 10. The August 2005 EE/CA has been updated to include surface and groundwater elevations and surface-water flow rates to assist in the explanation of their interaction(s). However, and as previously mentioned, this interaction has not been adequately explained and will require additional work. No discussions within the EE/CA regarding potential impacts of seasonal flow fluctuations have been made as requested by EPA and IDEQ.

EPA/IDeq – General Comment 11: With the exception of including basic information such as flow direction and ultimate discharge point(s), the hydrology section (i.e., Section 2.5.1) has not been updated as per EPA's and IDEQ's comments and thus requires additional detail and revision.

EPA/IDeq – General Comment 12: Generally, the "Source, Nature, and Extent of Contamination" section (i.e., Section 2.10) has not been expanded as requested by EPA and IDEQ. As with the May 2004 EE/CA, the revised version begins with discussions on lead and, with the exception of acknowledging elevated zinc concentrations in jig tailings, no discussions on additional metals/metalloids of concern are presented. As written, generalizations presented regarding waste rock and typical mining operations are questionable. For example, it is stated that waste rock "typically has lead concentrations of less than

1,000” parts per million (ppm). The concentration of lead in waste rock does not have a “typical” value but, rather, is dependent on area mineralogy and economic considerations that are mine and time specific. Similarly, additional inappropriate references to “typical” waste and ore concentrations are made. Perhaps these are typical concentrations within the Basin and, if such is the case, should be accordingly referenced. An additional section (i.e., Section 2.10.2 – Selection of COPCs) has been added to the EE/CA identifying COPCs for the Site and Basin. However, with the exception of petroleum hydrocarbons, which were identified in the May 2004 EE/CA, no additional efforts have been made to identify other site-specific COPCs (e.g., copper).

As with the May 2004 EE/CA, the revised EE/CA acknowledges that historical EPA sampling data for the Site identified metals concentrations indicative of concentrates. However, no efforts to specifically evaluate and discuss the discrepancy as compared with recent sampling events (i.e., concentrations orders of magnitude less than historical values) was completed as requested by EPA and IDEQ (August 2004).

Tables 2-1 and 2-2 provide a summary of railroad dimensions, including anticipated embankment volumes, for the Northern Pacific Railway (NPRy) and the Washington & Idaho Railroad Company (WIRR) Spur Lines, respectively. Based on the dimensions provided within the aforementioned tables, however, there appears to be a discrepancy in the calculated volumes. As a result, it is recommended that a typical cross section and associated sample calculation(s) be provided.

EPA/IDEQ – General Comment 13: The revised EE/CA evaluated soil lead, arsenic, cadmium, and zinc concentrations for the streamlined human health risk assessment; however, and as previously mentioned, no additional metals/metalloids were considered as COPCs, nor have potential land use types in specific zoning areas and/or future land use zoning and planning activities been considered. As a result, the revised EE/CA has not adequately addressed EPA’s and IDEQ’s comment and therefore requires further explanation and revision.

EPA/IDEQ – General Comment 14: With the exception of stating that “the lack of VOCs, SVOCs, PAHs, and PCBs warrants no further action regarding soil removals with respect to organic constituents,” detailed discussions and/or conclusions regarding the need, or lack thereof, for further remedial investigations and/or actions for petroleum contamination have not been provided within the revised EE/CA, as requested by EPA/IDEQ. It should also be noted that the proposed explanations for the observed hydrocarbon concentrations within the soil profile are questionable. For example, lube oil concentrations were typically greater within the top 6 inches of the soil profile than were concentrations to 6 to 24 inches below the surface, while diesel concentrations showed an opposite relationship (i.e., higher concentrations at depth). These differences in concentration gradients have been suggested to be the result of “weathering,” whereas a more reasonable explanation would be that the differences are related to the inherent differences between petroleum product physical properties and characteristics (e.g., viscosity) and soil adsorption characteristics. Therefore, additional information is required to explain the resultant soil concentrations and why such residual elevated levels (e.g., lube oil = 3,920 mg/kg) are not a risk to human health and/or ecological receptors. It should be noted that citing results for Volatile Organic Compounds (VOCs), Semi-Volatile Organic Compounds (SVOCs), and PCBs is not adequate, since these analyses do not necessarily consider the heavier carbon chains associated with lube oils.

EPA/IDEQ – General Comment 15: With the inclusion of a proposed on-site consolidation area within area WY-2, the revised EE/CA has addressed concerns regarding the use of Regional Repositories. In general, the use of an on-site consolidation area appears to be a reasonable remedial action. However, based on the limited information provided within the EE/CA, assumptions regarding the proposed location and underlying groundwater contamination and the anticipated source volumes, design considerations such as institutional controls, and closure and long-term monitoring plans need to be

developed and evaluated in greater detail. Also, in consideration of potential varying future land uses for the Site, the EE/CA should identify and evaluate a greater number of potential remedial alternatives.

EPA/IDEQ – General Comment 16: No additional detail as requested by EPA and IDEQ was provided regarding remediation details at the Hercules Mill site within this section of the report. Additional details regarding implementation of the remedial actions are listed within Section 6.4 of the report. It should be noted that within the recommended remedy for the Hercules Mill site, as with many other on-site areas (e.g., WY-1, WY-2, WY-3, and WY-4 to name a few), the recommended remedies are preceded with the following caveat, “If future use is restricted...” Given that landowners cannot impose deed restrictions themselves, the question that the revised EE/CA has not addressed is, what are the remedial alternatives if future land use is not restricted within these areas? Therefore, this question and others related to state, county, and local land-use laws and restrictions needs to be addressed in detail for the Site and associated Spur Lines.

EPA/IDEQ – General Comment 17: With the exception of identifying and discussing engineering challenges that may result during capping activities on embankment slopes, as requested, the revised EE/CA has provided a much more comprehensive and detailed description of proposed remedial actions along the Spur Lines. However, the EE/CA continues to imply that remedial activities will be conducted by others on a Basin-wide basis. It is important to note that an EE/CA should not serve to identify and/or allude to individuals/entities that may or may not perform remedial actions. Rather, the intent of an EE/CA is to thoroughly identify, present, quantify and evaluate the risks and appropriate remedial alternatives associated with the contaminants and potential concerns.

EPA/IDEQ – General Comment 18: As with previous versions of the EE/CA, the August 2005 report discounts the need for ecological receptors and does not adopt a Response Action Objective (RAO) for ecological protection. In general, the EE/CA identifies the lack of suitable habitat for terrestrial and aquatic resources as justification for not developing RAOs for the Site. As previously noted, additional analysis is required to evaluate ecological risks at the Site and Spur Lines.

EPA/IDEQ – General Comment 19: The revised EE/CA proposes that long-term operation and maintenance activities (e.g., routine inspections of institutional controls) be performed quarterly and as outlined within a “Maintenance and Repair Plan” submitted to EPA and IDEQ for approval. As currently written, the EE/CA identifies the landowner or Basin-wide institutional control programs as being responsible for adherence to the proposed Maintenance and Repair Plan (MRP). As previously mentioned, the intent of an EE/CA is not to identify a specific party and/or landowner as responsible for implementing, managing, and operating all activities outlined within the proposed MRPs; but rather, the EE/CA should identify appropriate remedial actions and/or MRPs consistent with the nature and extent of on-site contaminants, risks, and the Interim ROD. In addition, and as previously noted, the proposed remedial alternatives and associated MRPs should be expanded to include site-specific risk-management measures that address redevelopment considerations and construction activities.

EPA/IDEQ – General Comment 20: The revised EE/CA provides a comprehensive list of important Applicable or Relevant and Appropriate Requirements (ARARs); however, it does not identify how these ARARs are relevant to the Site and associated Spur Lines. In general, evaluations of ARARs as related to the Site are limited to “To Be Considered” or “Potentially Relevant and Appropriate.”

SPECIFIC EPA/IDEQ COMMENTS

The following is a brief summary identifying whether or not specific comments (*italicized*) as submitted by the EPA and IDEQ have been adequately addressed within the revised EE/CA. Again, the numbering system established in August 2004 has been maintained for easy reference.

20. *Page 1, General: The document needs a thorough edit to correct grammar, spellings, typos, etc... e.g., delete Wallace, ID in first sentence.* This has not been adequately addressed since spelling and grammatical errors are prevalent within the revised EE/CA (e.g., page 42 – endorse). In addition, there are several inconsistencies in the use of acronyms within the report (e.g., EE/CA vs. EECA and UPRR vs. UP), while abbreviations for milligrams per kilogram should be mg/kg not mg/Kg. It is important to note that the above-mentioned examples are not intended to be exhaustive but rather merely examples. It is recommended that a thorough editorial review be completed.
21. *Page 2, 2nd full paragraph: Delete “decision” before “documents” in three places. Only the ROD is a “decision” document in this context.* This has been addressed within the revised version.
22. *Page 2, 3rd paragraph: The most relevant documents are those prepared for the Trail of the CdAs. This document addresses the issues that exist herein.* This has been addressed within the revised version.
23. *Page 3, Paragraph 1: As stated under General Comments the EE/CA should not rely on the Basin HHRA to support decisions in this document. It is an appropriate and important reference, but this document needs to be site specific, and not paraphrase a report developed for cleanup actions over a period of 30 years.* This has not been addressed and requires further revision.
24. *In Section 2.1: We recommend that the width (average width and range, if appropriate) and total area of the Spur Lines be presented along with the length.* This has been addressed within the revised version.
25. *Page 4, 4th paragraph: Please clarify the phrase “inaccessible by conventional means” Does this mean that it cannot be driven on with a car or reached by pedestrians? Or, does it mean that it cannot be accessed for sampling with a backhoe?* This has been clarified, acknowledging that pedestrians cannot access these areas.
26. *Page 5, Paragraph 1: The trail has 8-foot shoulders and fencing on both sides to confine users to the trail.* This paragraph has not been modified to reflect that the trail has 8-foot shoulders and fencing on both sides.
27. *Page 5, Paragraph 2: There are no active mines in this area of the site.* This has been adequately addressed within the revised version.
28. *Section 2.4.2: The second sentence of Section 2.4.2 is confusing. Which soils are being referred to—the valley floor and the upper valley soils, or just the upper soils? Is the sentence intending to use “sloping to very steep” as a soil descriptor? Why is “Sloping” capitalized? What is the term “upper valley soils” referring to? Soils on the valley slopes or soils relatively more upstream in the valley?* Grammatical errors have been addressed; however, this section remains very confusing and requires further clarification. It is recommended that, at a minimum, discussions pertaining to the different soil types be distinguished by separate paragraphs.
29. *Page 6, Paragraph 4: What are steeply sloping flood plains?* Addressed by deletion.
30. *Page 7: Expand the last sentence of the second paragraph to include how much of the total area of the NPRy line is covered by the highway and what percentage does this represent of the total line length area.* This has been adequately addressed within the revised version.

31. *Page 8, Paragraph. 2.8: Strike “removal or” and insert “areas including” to read, “There have been several previous response actions within the areas including the Wallace Yard and Spur Lines.” This has been adequately addressed within the revised version.*
32. *Page 9, Paragraph 4: Another important fact about gravity methods that should be noted in the report is that zinc was not recovered. The presence of zinc is acknowledged within jig tailings.*
33. *Page 10, second bullet: The second bullet indicates that the Spur Lines were, at least in places, constructed as elevated railbeds with embankments. Were these cut, fill, or both? The configuration of railbeds should be more clearly described in the EE/CA. The geometry of the tailings and waste rock used as fill to construct any elevated railbeds could impact the feasibility of removal actions. This has not been addressed; further explanation and revision is required.*
34. *Page 10, 4th bullet, first sentence: Insert words as indicated with underline: “Concentrates potentially could be present within portions of the Site from spillage during derailments, from “weep holes” in the bottoms of open rail cars, from loading and unloading activities. This has not been addressed and requires further revision.*
35. *Page 11: The bulleted list on this page notes that some areas were not sampled because of overly steep embankments. Were alternative sampling methods considered? Is the use of hand auger sampling to collect at least shallow samples made impractical for some reason? Did the sampling plan not provide for access to more difficult sampling locations? This has not been addressed and will require further explanation and revision.*
36. *Page 11, 7th bullet: Please explain the basis for a site being, “Inaccessible.” This has not been adequately addressed given that the presence of heavily vegetated areas as noted within the EE/CA does not preclude the use of hand tools. Per comment 35, “were alternate sampling methods considered?”—presently, there are data gaps within the information provided, requiring further explanation and revision.*
37. *The EE/CA should present the rationale for the four metals selected for analysis in soil samples [presented in Section 2.9.3, page 12]. This has not been addressed and will require further explanation and revision.*
38. *On page 13, in the second paragraph: What is the basis for 2 feet being the “maximum practical depth” in which removals would be considered as a possible response action for Mine Waste contaminated soil? This is not necessarily the same as what individual parties would be willing to pay. This has not been addressed with the intent of the original question, but rather, simply refers to the 2-foot sampling depth as being specified within the Sampling and Analysis Plan (SAP). The phrase “maximum practical depth” has been deleted.*
39. *Page 12, 4th paragraph: This section refers to a ““water quality characterization” that was used to establish gaining and losing reaches as well as potential hydraulic interactions within groundwater. The EE/CA should include a complete reference for this report and describe its findings in greater detail. This has not been adequately addressed; further explanation and revision are required.*
40. *Page 13, Paragraph 1: Please explain the basis for “maximum practical depth.” This criterion has not been used elsewhere—not in Bunker Hill OU2 and not for the Trail of the CdAs. This has been addressed through deletion.*
41. *Page 13, first full paragraph: Strike the second sentence. Strike “also” from third sentence. This has been addressed within the revised version.*

42. *Page 14, Paragraph 1: The reference Table 2-5 contains a “j” qualifier that should be explained. Figures 2-6 through 2-13 show samples with a third number (e.g. sample 75). The qualifier for Table 2-5 has been included, but the third number on Figures 2-6 through 2-13 has not been addressed; further clarification and revision are required.*
43. *Page 14, Paragraph 3: The high levels at depth shown in Tables 2-7, 2-8, 2-9 are quite likely due to RR activities. This has not been adequately addressed and will require further explanation and revision.*
44. *Page 15: The rationale for a “warrants no further action” of 3,920 ppm lube oil near the Visitors Center must be justified. This has not been adequately addressed and will require further explanation and revision.*
45. *Page 16, first full paragraph: Why were two different methodologies for groundwater sampling used? Sampling using a bailer and sampling using a submersible pump are generally considered sufficiently different methodologies that analytical results could be influenced by the method selected. The EE/CA should provide the rationale for using these two different methodologies and draw defensible conclusions that the data generated are comparable. The revised EE/CA clarifies that groundwater purging activities were completed with either a submersible pump or bailer, while all environmental groundwater sampling activities were completed using a bailer only. However, it presently remains unclear whether a dedicated bailer was employed for each monitoring well, or whether one bailer was employed and decontaminated between sampling events. Additional clarification is requested.*
46. *In Section 2.9.6: How does the groundwater gradient and flow direction compare to previously collected data? Is it consistent? Are the detection limits for dissolved arsenic and lead below the RGs? The EE/CA should explain the ramifications of the dissolved metals versus total metals analyses and provide a rationale for which results were used in remedy decision making. This has not been adequately addressed; further explanation and revision are required.*
47. *Page 17, Paragraph 1: A more comprehensive discussion of the local hydrologic setting is needed. The Site is within and part of a larger watershed. This has not been adequately addressed and will require further explanation and revision.*
48. *Page 18, second paragraph: What is the rationale for collecting composite water samples from the surface? Why is this method better for meeting the project objectives than collecting one or more discrete samples from an intermediate depth in the stream water column? Based on information presented within the revised EE/CA, it would appear that surface-water sampling methods employed were consistent with the SAP. It should be noted that a copy of the SAP was not provided; and, as such, it is unclear whether or not this question has been adequately addressed.*

49. *Page 19, last paragraph, final sentence: Insert “perhaps” before “due to the fact that...”* Addressed by deletion.
50. *Page 19, Paragraph 1: The EE/CA should provide a more complete discussion on “total” vs. “dissolved” metals analysis. Which is used where and why?* This has not been adequately addressed and will require further explanation and revision.
51. *Page 19: The report should provide a rationale for what is happening between SW-3 and SW-4? Concentrations go up as does flow.* This has not been adequately addressed and will require further explanation and revision.
52. *Page 19: Just as the Trail of the CdAs EE/CA does, this part of the report needs a section on fate and transport.* No discussions on fate and transport mechanisms (e.g., adsorption, diffusion) are present within the revised EE/CA. As such, the original comment has not been adequately addressed and will require further explanation and revision.

Comments 52 through 63 are related to the requirement that a streamlined human health and environmental risk assessment be conducted for the Site and Spur Lines. Given that this section of the report has been modified considerably in the attempt to address previous comments and concerns, a direct comparison cannot be made to the initial comments. Rather, general items of discussion and concern regarding the streamlined human health and environmental risk assessment presented within the EE/CA have been addressed within other portions of this memorandum. As previously noted, significant improvements have been made in the evaluation of site-specific risks; however, additional efforts are required to support current assumptions and conclusions (e.g., lack of suitable habitat precluding an ecological risk assessment).

64. *Page 26: The “Response Activities Schedule” must include more detail to be consistent with SOW Paragraph 4(c): “A general schedule is needed for all phases of the removal activities, from conducting the EE/CA to completing the removal action. Factors that can be considered that can affect the schedule include time needed for sample preparation and analysis, statutory requirements, available financial and technical resources, and weather (short construction season).”* This has not been adequately addressed and will require further revision. For example, it does not appear that all phases of removal activities have been acknowledged (e.g., EE/CA), while additional scheduling considerations (e.g., sample preparation and analyses) do not appear to have been considered.
65. *Section 4.0 and others: “long-term.” Is incorrectly spelled as “long-tern”.* Incorrectly spelled words are still prevalent within the report. As such, it is recommended that a thorough editorial review (figures, tables, and appendices included) be completed.
66. *Page 28, 1st bullet: The proposed S4 alternative should apply to residential yards and “commercial properties.”* This has not been adequately addressed and will require further explanation and revision.
67. *Page 28, Bullet 1: S4 also includes commercial properties.* This has not been adequately addressed and will require further explanation and revision.
68. *Page 28: The first bullet on page 28 appears to be missing text. In general, the clarity and readability of the EE/CA would be improved by an editorial review. We noted many spelling, grammar, and punctuation errors that tended to obscure the technical content of the document.* This has not been adequately addressed and will require further explanation and revision.

69. *Section 4.2: The first paragraph of Section 4.2 appears to acknowledge the interim nature of the Basin Interim ROD, and the fact that decisions arising from EE/CA should be consistent with long-term actions. Long-term actions in the basin are likely to include a final ROD that addresses ecological risk in addition to human health risk. The EE/CA should therefore evaluate whether the remedies proposed are likely to be consistent with future requirements for protection of the environment. The EE/CA should make every effort to propose remedies that do not require a later duplication of effort (e.g., a deeper soil removal or thicker cap). Section 4.2 should also provide a more rigorous rationale to justify adoption of the interim ROD conclusions regarding the selected remedy. Site-specific conditions should be quantitatively compared to Basin-wide data to show that the Site fits within the assumptions used in making Basin-wide decisions. This has not been adequately addressed and will require further explanation and revision.*
70. *Page 31, Section 5.0: Don't rely on the Basin ROD. It covers at least 30 years. Be specific to the Site. See EE/CA for the Trail of the CdAs. This has been addressed to a limited extent but require further explanation and revision (e.g., inhalation exposure for human health considerations and an environmental risk assessment).*
71. *Section 5.1.1, 1st paragraph: If UPRR "vacates these leases," what is to prevent future occupation of existing houses? Will houses be demolished? Can deed restrictions be placed on property to prevent future residential use? How? This has not been adequately addressed and will require further explanation and revision. For example, it is commonly stated that deed restrictions will be put in place, yet no explanation of how these restrictions and/or caveats will be established on the deeds is discussed. In addition, consideration should also be given to potential changes in land use as a result of rezoning. As a result, some of the assumptions employed during the streamlined human health risk assessment may need to be reconsidered.*
72. *Section 5.1.2, chart for Recommended Remedy: What is the basis for the proposed no action for the Visitor Center area for lube oil identified in sampling? What is the basis for 6-inch gravel barrier instead of 12-inch specified in Basin ROD? How will the grade be maintained by adding 6 or 12 inches of gravel barrier to parking area? Isn't this area used for community carnivals, subject to dust from heavy vehicles and machinery? Need excavation before placement of clean barrier. This has been addressed by proposing to excavate and dispose on site within the containment facility 12 inches of contaminated material, to be replaced with 12 inches of clean gravel. It is proposed that a Maintenance and Repair Plan as approved by EPA and IDEQ be implemented to address any and all operational and maintenance concerns. As previously noted, however, the implementation of the aforementioned plan and its ensured use remains questionable and should be further discussed. Perhaps this is one item that can be placed as a caveat (i.e., restriction) on the deed.*
73. *Page 33, Paragraph 1: Use of the Big Creek Repository for residential yard cleanup material is not guaranteed. This has been addressed by proposing to construct an on-site containment facility within WY-2.*
74. *Page 33, last paragraph: Use of the parking area by heavy vehicles requires, according to ICP, a 12 inch cap. As per comment 72, this has been adequately addressed.*
75. *Section 5.1.4., "Recommended Remedy" chart: Is there an exposure difference between "commercial" and "industrial" areas? If so, what? If not, should be same remedy. What is the basis for difference from Basin ROD, 6 vs. 12-inch barrier? This has not been addressed by the development of separate land-use, which is consistent with the Interim ROD.*

76. *Page 36, 1st bullet: Before relying on “restrictive covenant” to minimize exposures before remediation, implementability must be established, and should include a legal analysis of State property law.* This has not been adequately addressed and will require further research and revision.
77. *Section 5.1.5: What is basis for distinguishing “existing manufacturing/industrial facility” from other commercial properties? Strike this section.* Based on human health risks, the revised EE/CA attempts to distinguish manufacturing/industrial facilities from commercial properties. However, the separate manufacturing/industrial facility land use and exposure scenario is inconsistent with the Interim ROD and the proposed Basin ICP, and is not supported with information contained in the revised EE/CA.
78. *Section 5.2, 2nd bullet: What is the basis for limiting excavation to “five feet” around foundations. Foundations are not far from occupied residences and people were seen walking more than five feet past the foundations on our site visit in 2003.* Contamination levels tend to be higher around foundations. To be consistent with the Operable Unit 1 and 2 (the Box) remedial actions, and those being conducted at other Basin mine and mill sites, some excavation around foundations will be required prior to placement of vegetative or gravel barriers.
79. *Section 5.3: Strike the second sentence. It’s not true that “The only recreational areas identified within the Basin ROD are located in the Lower Basin.” The Basin ROD also identified, for example, the Rails-To-Trails conversion of the UP right-of-way as a recreational area.* This has been addressed.
80. *Page 38, the recommended remedy for “Existing Unpaved Area”: Removal does not depend on availability of disposal capacity within Upper Basin. Strike this sentence in the box.* This has been addressed.
81. *Page 38, the recommended remedy for “Residential, Common Areas, or Recreational Areas”: If needed, should not wait for implementation of the Basin ROD. These areas should be addressed if unpaved.* This has not been adequately addressed and will require further explanation and revision.
82. *Page 39 and 40, recommended remedies for “Residential Areas,” “Common Areas,” “Recreational Areas,” and “All other areas”: Should describe response action in detail (not just “remediate those portions...”)* *Strike all clauses “...as part of the Basin remediation...”* This has not been adequately addressed and will require further explanation and revision (i.e., references that the work will be performed as part of the Basin ROD remain).
83. *Page 40:*
- *2d sentence, replace “would” with “might” as indicated: “Such a partial remediation might not be effective.”*
 - *3d sentence, edit as follows: Therefore, any remediation of the residential, common use, or recreational areas with the Canyon Creek or Ninemile area may consider the timing of any other Basin remediation..”* This has been addressed through deletion; however, references that remediation efforts will be completed as part of the Basin ROD remain. Therefore, further explanation and revisions will be required.
84. *Figure 1-2: The color coding is not consistent.* This has been addressed.

ADDITIONAL GENERAL COMMENTS

- I. With the exception of acknowledging that the Hercules Mill had operated at the Site at one point in time and that residual concrete foundations remain, there is no discussion as to ore types and/or quantities of minerals processed during the mill's operational history. Please note that such information may be extremely useful in identifying site-specific CPOCs and explaining the analytical results collected to date.
- II. Within Section 2.10.3 – Site Characterization, it is noted that “results of the water quality characterization were used to establish gaining and losing reaches as well as potential hydraulic interactions with groundwater.” Please note that water quantity alone, or in combination with conservative water quality parameters (e.g., chloride) should be used to assess and quantify hydrologic interactions between the South Fork CdA River and underlying Site groundwater. Based on the water quality parameters reported within the EE/CA (e.g., metals) and the uncertainties associated with groundwater flux through the Site at this time, it is not believed that surface water and groundwater interactions at the Site have been properly or adequately explained.
- III. The reported formula used to calculate flow rates within the South Fork CdA River and adjoining tributaries (i.e., Placer Creek, Daily Gulch, and the Unknown Canyon) is incorrect as written on page 23 of the EE/CA. The correct formula to calculate river/stream flow rates using the area-velocity method must sum the incremental flow rates. As a result, the correct formula is as follows:

$$Q = \sum(A_i \times V_i)$$

Where:

Q = Total river/stream discharge (ft³/sec)

A_i = Individual partial cross-sectional area (ft²)

V_i = Mean velocity of the flow to the corresponding partial area (ft/sec)

- IV. Within Section 2.10.9 – Surface Water Sampling Results, it is implied that although elevated concentrations of cadmium and zinc are recorded at sampling locations located adjacent to the Site (e.g., SW-2 and SW-3), this is the result of upstream sources (i.e., “concentrations were less than” the upstream station [SW-1]) as opposed to Site conditions. However, based on the data presented within the EE/CA (i.e., Table 2-18), surface water samples collected during the March 2005 sampling event identify cadmium and zinc concentrations (i.e., total and dissolved fractions) as being greater at SW-3 than SW-1 (i.e., upstream). As a result, it would appear that although upstream water quality is elevated in heavy metals, Site conditions might also adversely affect surface water quality of the South Fork CdA River. Additional sampling and/or modeling is recommended. Therefore, at this point in time, there is insufficient data to conclude that the contribution of metals loading to the South Fork CdA River from Site groundwater “is relatively minimal.”
- V. Within Section 2.10.9 – Surface Water Sampling Results, the last bullet summarizing the results states that cadmium, zinc, and lead concentrations within the South Fork CdA River were all less than the concentrations predicted in the Basin RI for the upstream location SF12, tending to suggest that surface-water metals concentrations recorded adjacent to the Site were from upstream sources. There does not appear to be any doubt that upstream water quality has been adversely affected by historical mining practices within the Basin and residual mine wastes. However, SF-12, as illustrated within Figure 2-4, is located on Ninemile Creek and not on the South Fork CdA River. As such, analytical results and estimated loadings collected from surface-water monitoring station

SF-12 are reflective of conditions within Ninemile Creek, not the South Fork CdA River. Rather, data collected from this station can be used to assess its contribution to contaminant concentrations/loadings to the South Fork CdA River. It is recommended that this bullet be reworded and that a mass balance for the system be performed to better assess spatial variations in contaminant concentrations and loadings along the South Fork CdA River as they relate to the Site.

- VI. General comments regarding all figures within the revised EE/CA include (1) north arrows and scale bars should be located in areas unobstructed from figure details, (2) yellow shading and/or font should be avoided since it is difficult to see and read, and (3) extraneous key definitions are located within legends on several figures (e.g., Figure 2-1).
- VII. Support for Assumptions, Inferences, and Conclusions: It frequently was difficult to understand the scientific basis of assumptions and conclusions because there were few specific references to supporting documentation of either the literature or the gray literature studies published as part of the Coeur d'Alene Basin RI/FS.
- VIII. Ecological risks posed by metals associated with the Spur Lines:
 - a. The report appears to discount risks to plants, terrestrial wildlife uses, and to aquatic life in the streams proximate to the Spur Lines. What is the basis for this discounting?
 - b. Apparently, the Spur Lines were not sampled for metals in surface water because this was not in the scope of work. The reasoning for this should be documented, so that EPA may evaluate the reasoning on which the decision was based. The areas occupied by the Spur Lines in the canyons may be considerable compared to Wallace Yard (areas should be computed and reported). Also, these Spur Lines were constructed in part with mine wastes, and thus probably will be a source of metals to the adjacent streams and then to the South Fork CdA River. Therefore, a question arises as to whether or not metals loading from these sources needs to be limited in order to restore aquatic life downstream.
- IX. Surface Water Loading of Metals: Was it defensible to omit loading calculations of total cadmium and zinc at Wallace Yard? This question has two facets, (1) was the surface-water sampling adjacent to Wallace Yard indicative, and (2) is the decision supported by the literature. A study by USGS concerning metals loading in the CdA Basin indicated that metals loading was flow-weighted, with total metals loading being much higher during the highest flows (due to erosion of metals from the banks) (Clark 2003). This raises the question of whether the samplings, conducted when South Fork CdA River stream flows were 61 ft³/sec (10/28/04), 110 ft³/sec (11/17/03), and 272 ft³/sec (3/29/05), were representative. One would expect loading of dissolved metals to be lowest during low flows, but no mention is made as to whether sampling during the 61 ft³/sec flow was representative. Similarly, how representative of high-flow conditions was the 272 ft³/sec loading and was it sufficient to measure loading from metals eroded from the Wallace Yard site? It appears that flooding of Wallace Yard was a possibility, so what are the implications concerning erosion of total metals?
- X. Clean Sampling Techniques for Groundwater and Surface-Water Samples (e.g., page 24, paragraph 3): Were clean sampling techniques used for the metals sampling? Were the filters discarded after each use in the collection of dissolved metal samples, as part of the surface water sampling? Similarly, how was the filtration apparatus decontaminated between filtration of samples collected at different locations? The questions relate first to the possibility of cross contamination and then to data reliability.

- XI. Abbreviations and Acronyms: The report's list of acronyms and abbreviations is incomplete. Several do not appear to be defined, for example, TMB, CT, and LADD, to name just a few, while others (i.e., AOC) have two separate meanings (e.g., Administrative Order on Consent and area of contamination).

SPECIFIC TECHNICAL COMMENTS

The following comments are specific to the page (P), paragraphs (Para.), and lines noted.

Page 3, Para. 2, last two sentences: Can you estimate the acreage encompassed by the Canyon Creek and Ninemile Creek Spur Lines, so that these can be compared to the acreage (43 acres) occupied by the Yard? Do you have an estimate of the volume of mining waste occupied by the three sites?

Page 11, 1st full Para., regarding Woodland Park and areas remediated: This area is mentioned several times but apparently not identified on the maps. It would be instructive to define these areas relative to the Spur Line locations.

Page 13, Para. 3, Line 5 regarding elevated zinc concentrations: Can you identify the range of concentrations being referred to?

Page 17, Para. 2, Lines 4 and 5: Why were these three tributary creeks sampled and where is their location (e.g., on Figure 1-1) relative to the Yard? For example, do they simply provide information needed to evaluate their potential effects on mass loading computations for Wallace Yard?

Page 17, Para. 3, Line 3 regarding hand sampling: Did you manually sample the same depth intervals as sampled with the backhoe?

Page 24, Para. 2, Line 1: Hardness, alkalinity, pH, and dissolved organic carbon, in addition to suspended solids, influence bioavailability of certain metals in surface waters. Were any of these water quality parameters measured?

Page 24, Para. 2, last line: Can you furnish the reference(s) documenting that dissolved lead concentrations predominate in surface water in the South Fork CdA River? In addition, can you identify the percentage of the lead (preferably mean and standard deviation) underlying the connotation of "typical"? Be aware that a USGS report contends that most of the lead is carried by suspended solids and is due to erosion of tailings during peak-flow events (Clark 2003).

Page 26, 1st full Para., Line 4, regarding excluding mass loading analysis for total cadmium and total zinc: Need references to support this judgment. Studies by others on the CdA River system may support this statement for zinc but not for cadmium and lead. Studies by the USGS indicate that mass loading of metals in this system is heavily flow-weighted, such that metals loadings are highest during the high-flow events that mobilize particle-associated metals (Clark 2003).

Page 28, Para. 3, Line 3 regarding "comparable": Can the report define comparable by including a table that establishes this, preferably by presenting concentrations in terms of means and standard deviations so that the reader can, if needed, compare probabilities associated with different percentiles.

Page 31, Table: Why would there be no secondary contact (fishing, wading) in the South Fork CdA River, especially in the future? These uses should occur in the future as fisheries return, in response to remediation and improvements in stream and riparian habitat. It would seem expedient to quantify hazard quotients for secondary contact so there is documentation for the public concerning risk from these exposures.

Page 32, Para. 1, Lines 3 and 4: Could the document explain why inhalation was not considered?

Page 33, Para. 1, Line 2: It seems inexplicable that the mean and 95 percent confidence limit would not be significantly different. Two comments. First, the document should present the mean metal concentration plus and minus one standard deviation so that the reader can assess the range of variation and confidence limits, plus conduct a probabilistic analysis if desired. Second, is it standard to use an estimate of the maximum value for the acute RME and the upper 95 percent confidence limit of the mean for the chronic RME exposure? If so, use of the mean values may be assumed to underestimate exposures. However, without information on standard deviations, the reader is not in a position to appreciate the extent.

Page 33, Table: What are the receptors for the Spur Line? The boxes are blank.

Page 34, 1st bullet: Need to demonstrate the validity of this assumption for these sites. “The Basin ROD indicates that arsenic and cadmium are co-located with lead, and remediation of lead above the action levels will address cadmium and arsenic.” Unsupported statements cannot be accepted; there must be appropriate documentation of the science and the supporting literature.

Page 34, 2nd bullet, Lines 1 and 2: If 99 of the soil samples met this criterion, what was the number and percentage that did not?

Page 34, Para. 2, Line 4 regarding dust: Two comments. First, the inhalation pathway was not considered, but it needs to be because the document acknowledged that dust inhalation would occur. Second, the document assumes worker exposure inside the workplace will not involve dust or soil exposure. If there are no deed restrictions, how can any assumptions be made concerning the workplace dust and soil exposure? Some exposure scenarios (e.g., driving a forklift across a yard) could generate considerable dust as well as create finer particles via the compaction. The assessment needs to provide documentation in support of its statements.

Page 34, Para. 2, second to last line regarding adjusted: Explain what is meant by this, and provide documentation supporting the adjustments.

Page 34, Table: Documentation for the assumptions concerning soil ingestion (10 mg/day) and exposure frequency (187 days/yr) needs to be provided, especially given the range of possible future types of industrial and manufacturing uses possible.

Page 38, Para. 1, Line 1 regarding “It is reasonable to assume that an industrial/manufacturing worker would not experience any exposure associated with the workplace to Mine Waste contaminated soils.”: Documentation, including deed restrictions, may be needed to support this statement, since it is equally plausible—going forward—that there could be many businesses that do not pave their yards and drive over them at high frequency with fork lifts and other equipment or vehicles.

Page 39, Para. 4, Line 2 regarding 1×10^{-4} cancer risk level: EPA considered the default risk relative to 1×10^{-6} . A risk level of 10^{-4} may be acceptable under certain exposures, but not categorically acceptable.

Page 43, Para. 2: The Wallace Yard does not appear to be suitable habitat for plants or terrestrial wildlife, presently or in the future, given the past and projected uses. However, the Yard’s banks bordering the South Fork CdA River will be habitat to fish and macro-invertebrates in the South Fork CdA River, especially once the river is remediated. The future potential needs to be considered.

Page 44, Para. 1, Lines 1 and 2: There needs to be improved support for the conclusion that the Wallace Yard has not contributed and is not contributing in any material way to the aquatic ecological risk. First of all, the South Fork CdA River in this area is water-quality limited by metals, and Tables 2-20 and 2-21 indicate that there is a cumulative addition of metals to the river by Wallace Yard. This report should determine the loads of Cd, Pb and Zn carried by the South Fork CdA River and compare it to the loading estimated from Tables 2-20 and 2-21 in order to determine whether it is necessary to reduce the additions from Wallace Yard.

Page 44, Para. 2: Several comments here. The first is that this section does not address risks posed by metals leached or eroded from the railroad Spur Lines. The intent of the second paragraph is unclear. It indicates that the streams are severely degraded and fish populations have been impacted (true, but due to both metals and channelization, fines, and other factors). However, it fails to address the key question here of the estimated contribution of metals from the railroad grades. It may not be defensible to constrain the assessment to lead and zinc on the thesis that lead and zinc were the primary risk drivers for the Basin ERA. The question here is, why are metals posing risks in the creeks and to what degree do the railroad grades augment those risks via leaching and erosion of particle-associated metals?

Page 44, Para. 3: This paragraph appears to argue that the narrow strips of land occupied by the Spur Lines do not constitute quality habitat for terrestrial plants and wildlife; therefore, they are inconsequential to the area's overall habitat, and the Basin ERA PRGs can be ignored. However, each line is over several miles long, and over time will, if allowed to, be gradually reclaimed by vegetation. The fundamental issue is whether or not a suitably balanced assemblage of natural plant species can grow on the Spur Lines; and, if so, would consumption of these plants pose a risk to wildlife. If so, over time, the Spur Lines will be indistinguishable from the adjacent landscape, in the same way that old logging rail grades generally are indistinguishable in forests.

Page 44, Table, Column 3, regarding "Estimates from Basin RI": To what areas of the Basin do these estimates pertain, for the comparison to the sediment loading from the spur line embankments to be appropriate?

Page 44, last Para., Line 3 regarding negligible: There is no basis in fact supporting this statement. This statement needs to be supported with an analysis.

Table 2-9 regarding frequency: The frequency (number of occurrences) is an ambiguous value because it is not related to the total number of samples collected. It may be more appropriate to state frequency as a proportion or percentage and then add a column defining the total number of samples. In this way, it would be more informative and utilitarian.

Table 2-17: This table suggests that Wallace Yard groundwater is not a source of dissolved arsenic or lead but is a source of dissolved cadmium and much dissolved zinc. This should be addressed. Also, please clarify in the title that this table pertains only to Wallace Yard.

Table 2-18: Several comments. First, each table should be self-explanatory (stand-alone); therefore, it would be useful to signify the sampling date next to each heading (e.g., Winter 2003 Sampling Event). (Note that this was done in Table 2-17.) Second, it would be more informative to all readers if concentrations were presented as the mean plus or minus one standard deviation. Mean values alone are informative without information on variability.

Table 2-10: What were the estimated loads carried by the South Fork CdA River at the time of sampling? This may be useful in determining the cumulative addition of metals from this site to the river.

Table 2-21: What would be the loading to the river from Wallace Yard at the South Fork CdA River's 7Q10? This seems to be a key question. The dates and flows sampled are snapshots, and perhaps the most important flow is the lowest, sampled on October 28, 2004. At this flow, dissolved zinc loading appeared to be 33 percent higher at SW-4 than at SW-1. What was this loading relative to that of the South Fork CdA River? This loading potentially could be higher at the River's 7Q10, depending on groundwater flow.

Table 2-22: Only at low flow can metal loading via Wallace Yard groundwater be distinguished in the South Fork CdA River.

Table 3-1: This table is not stand-alone, i.e., self explanatory. For example, should the boxes be filled in, in the row corresponding to Wallace Yard, Industrial/Manufacturing, and columns labeled Pb and Risk Assessment? What does NC stand for (at the bottom of the Pb column)?

Literature Cited

Clark, G.M. 2003. Occurrence and transport of cadmium, lead, and zinc in the Spokane River basin, Idaho and Washington, water years 1999–2001. Water-Resources Investigation, U.S. Geological Survey.